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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/390,141 | 09/03/1999 | Ellen M. Sentovich | 21891.02700 | 6380 |

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| EXAMINER | |
|---|---|
| CHOW, CHIH CHING | |
| **ART UNIT** | **PAPER NUMBER** |
| 2122 | |

DATE MAILED: 02/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/390,141 | SENTOVICH ET AL. | |
| | Examiner | Art Unit | |
| | Chih-Ching Chow | 2122 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *03 September 1999*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 September 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/14/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. This action is responsive to the application filed on September 03, 1999.

2. The priority date considered for this application is September 03, 1999.

3. Claims 1-51 have been examined.

### *Drawings*

4. The informal drawings are not of sufficient quality to permit examination. Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to this Office action. Any required corrective action should be submitted in the next Office action. The correction will not be held in abeyance.

### *Claim Objections*

5. Claim 2 is objected to because of the following informalities: 'using at least two computer languages to write said said plurality of source code statements". Appropriate correction is required.

6. Claim 5 is objected to because of the following informalities: last sentence of before (a), "comprising the.steps of". Appropriate correction is required.

7. Claim 43 is objected to because of the following informalities: "slitting said hybrid code", should be **splitting**. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-2, 4-5, 39-40, 45-46, 49, 50, and 51 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that claims 1-2 fail(s) to correspond in scope with that which applicant(s) regard as the invention can be found in the first paragraph under the Summary of the Invention (page 4), "a combined language-compiler configured to compile a program comprising a plurality of code statements written using a plurality of computer languages"; further, in the second paragraph under Detailed Description of the Preferred and Alternative Embodiments (page 9), applicant has stated that "using a specific computer language example, ECL, a hybrid of Esteral and C" -- both statements indicate that the invention is a **combined-language compiler**, which compiles a combined-language, ECL. The 'combined-language compiler' actually has a different meaning than the 'combined language-compiler', the former means a compiler for ONE COMBINED LANGUAGE, and the latter means ONE COMBINED COMPILER for multiple language compilers. Base on the illustration in the spec, the Examiner thinks using the 'combined-language compiler' for the claims would be more appropriate for the claimed invention. Claims 4-5, 39-40, 45-46, 49, 50, and 51 are

also rejected under 35 U.S.C. § 112 for the same reasons. Additionally, the Applicants has recited 'combined E/C language' throughout all the Claims, where it really should be 'ECL' instead.

### *Claim Rejections - 35 USC § 101*

10. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. Claims 1, 2, 4, 5, 39, 40, 45, and 46 are rejected under 35 U.S.C. § 101 as being directed to nonstatutory subject matter.

> Claim 1 recites
> 'In a combined language-compiler a method of compiling a code comprising a plurality of code statements using said combined language-compiler, said method comprising the steps of:
> (a) parsing said plurality of code statements into a combined representation of said plurality of code statements;
> (b) splitting said combined representation into a plurality of sets of code statements, each said set comprising a plurality of independently compilable code statements;
> (c) compiling each said set of code statements; and
> (d) merging each said set of compiled statements into a single executable program.'

The language of the claim raises a question as to whether the claim is directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 USC § 101.

Furthermore, under the most recent Federal Circuit cases, transformation of data by a machine (e.g., computer) is statutory subject matter provided the claims recite a "practical application, which produce[s] a useful, concrete and tangible result." State St. Bank & Trust Co. v. Signature Fin. Group, Inc. 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1600-01 (Fed. Cir. 1998).

In this instance, the Office's interpretation of this claim is that it does not expressly or implicitly require performance of any of the steps by a machine such as a general-purpose digital computer. Structure will not be read into the claim for the purposes of the statutory subject matter analysis although the steps might be capable of being performed by a machine.

On this basis, Claim 1 is rejected under 35 U.S.C. § 101 as being directed to nonstatutory subject matter.

Claims 2, 4, 5, 39, 40 and their dependent claims are rejected under 35 U.S.C. § 101 as being directed to nonstatutory subject matter for the same reasons set forth in the rejection of Claim 1.

Claims 45 and 46 recite a combined language compiler comprising software components that perform the same method steps of Claims 1, 2, 4, 5, 39 ad 40 taken individually or in combination. Therefore, the same rejection is applied.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeffrey Dean et al. (hereinafter "Dean"), "Vortex: An Optimizing Compiler for Object-Oriented Languages", OOPSLA '96.

| **CLAIM** | **Dean** |
|---|---|
| 1. In a combined language-compiler a method of compiling a code comprising a plurality of code statements using said combined language-compiler, said method comprising the steps of:<br>(a) parsing said plurality of code statements into a combined representation of said plurality of code statements;<br>(b) splitting said combined representation into a plurality of sets of code statements, each said set comprising a plurality of independently compilable code statements;<br>(c) compiling each said set of code statements; and<br>(d) merging each said set of compiled statements into a single executable program. | Dean teaches a combined language-compiler which can compile a code comprising a plurality of code statements. For item (a), See Dean's page 85, first paragraph under 3. "Each of the different front-ends does whatever **parsing** and typechecking are appropriate for its input language, and then translates the input into the Vortex compiler's intermediate language (IL)". For item (b) - (d), see Dean page 86, Figure 1, the separately compiled code, are all generated to Vortex Intermediate Language (*combined representation*), and the IL **split** combined representation into different code statements, and they got **compiled** again (*code gen.)* for each different code statements. Finally, the separated results got bind together (*merging*) for program execution. |
| 2. In a combined language-compiler a method of compiling a code comprising a plurality of code statements using said combined language-compiler, said method comprising the steps of:<br>(a) parsing said plurality of code | Same as Claim 1. |

statements into a combined representation of said plurality of code statements;
(b) splitting said combined code into a plurality of sets of code statements;
(c) using at least two compilers to compile said plurality of sets of code statements; wherein each said set is compilable by one said compiler; and
(d) merging each said set of compiled statements into a single executable program.

3. The method of claim 2, wherein said step (a) of parsing said plurality of code statements into said combined representation further includes the step of:
using at least two computer languages to write said said plurality of source code statements.

Dean's disclosure used at least two computer languages. For the rest of Claim 3 feature see Claim 1 rejection.

39. In a combined language-compiler, a method of compiling of a hybrid source code using said combined language-compiler, said method comprising the steps of:
(a) parsing a plurality of statements of said hybrid source code;
(b) splitting said hybrid source code into a plurality of sets of code statements, each said set comprising a plurality of code statements compilable by one said compiler;
(c) compiling each said set of code statements; and

Same as Claim 1 rejection.

| | |
|---|---|
| (d) merging each said compiled code statement into a single executable program. | |
| 40. In a combined language-compiler, a method of compiling of a hybrid source code using said combined compiler, said method comprising the steps of:<br>(a) parsing said plurality of code statements of said hybrid source code into a combined representation;<br>(b) splitting said combined representation into a plurality of sets of hybrid code statements;<br>(c) using at least two compilers to compile said plurality of sets of hybrid code statements; wherein each said set is compilable by one said compiler; and<br>(d) merging each said set of compiled statements into a single executable program. | Same as Claim 1 rejection. |
| 41. The method of claim 40, wherein said step (a) of parsing said plurality of hybrid code statements further includes the step of:<br>using at least two computer languages to write said plurality of hybrid source code statements. | Same as Claim 3 rejection. |
| 42. The method of claim 40, wherein said step (b) of splitting said hybrid code into said plurality of sets of code statements further comprises the steps of:<br>splitting said hybrid code at a | Dean also mentioned benchmarking different set of trial code in his disclosure, see Dean's Table 2 and Figure 2, the implementation details do not have to be identical. For the rest of Claim 42 feature see Claim 1 rejection. |

specification level into two different trial codes, wherein said first trial code includes a first plurality of code modules including a first plurality of internal module computations, a first plurality of inter-module communications, and a first level of reactivity, and wherein said second trial code includes a second plurality of code modules including a second plurality of internal module computations, a second plurality of inter-module communications, and a second level of reactivity;

comparing said first trial code with said second trial code;

assessing the difference in compilation time and the difference in execution time between said two trial codes; and

selecting an optimum trial code.

43. The method of claim 40, wherein said step (b) of splitting said hybrid code further includes the step of:

slitting said hybrid code at a compilation level into a plurality of reactive code statements and a plurality of non-reactive code statements.

Same as Claim 1 rejection.

44. The method of claim 40, wherein said step (b) of splitting said hybrid code further comprises the step of:

splitting said hybrid code based on an implementation method.

Same as Claim 1 rejection.

45. A combined language-compiler

| | |
|---|---|
| comprising;<br>(a) a merged syntax defining a plurality of acceptable code statements;<br>(b) a splitter configured to split said combined code into a plurality of sets of code statements;<br>(c) a compiler configured to compile each said set of code statements; and<br>(d) a post-compiler level merger configured to merge each said compiled code statement into a single executable program. | Same as Claim 1 rejection. |
| 46. A combined hybrid language-compiler comprising:<br>(a) a syntax of a hybrid language defining a plurality of acceptable code statements;<br>(b) a splitter configured to split said hybrid code into a plurality of sets of code statements, each said set comprising a plurality of code statements, each said code statement compilable independently;<br>(c) a compiler configured to compile each said set of code statements;<br>(d) a checker configured to check whether each said compiled code statement satisfies the semantics of said hybrid language; and<br>(e) a post-compiler level merger configured to merge each said compiled code statement into a single executable program. | Same as Claim 1 rejection. |
| 47. A computer-usable apparatus useful | Same as Claim 1 rejection. |

in association with a combined language-compiler, said combined language-compiler configured to compile a plurality of code statements; said computer-usable apparatus including computer-readable code instructions configured to cause said combined language-compiler to execute the steps of:

(a) defining a plurality of acceptable statements of a combined code;

(b) splitting said combined code into a plurality of sets of code statements, each said set comprising a plurality of code statements compilable independently;

(c) compiling each said set of code statements; and

(d) merging each said compiled code statement into a single executable program.

48. A computer data signal embodied in a carrier wave comprising:

(a) a first merged source code segment comprising a plurality of code statements; wherein each said code statement is configured to be compiled independently;

(b) a split source code segment comprising a plurality of sets of code statements;

(c) a combined compiled source code segment comprising a plurality of compiled source code segments; and

(d) a second merged source code

Same as Claim 1 rejection.

segment comprising a plurality of compiled code statements as a single executable program.

50. A computer-readable code embedded in a storage medium, wherein said computer readable code is manipulated by a combined language compiler, said combined language-compiler configured to compile a plurality of code statements written using a plurality of computer languages, said combined language-compiler configured to execute the steps of:
(a) accepting a combined code comprising a plurality of code statements;
(b) splitting said combined code into a plurality of sets of code statements, each said set comprising a plurality of independently compilable code statements;
(c) compiling each said set of code statements; and
(d) merging each said compiled code statement into a single executable program.

Same as Claim 1 rejection.

***Allowable Subject Matter***

14. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record, i.e., Dean et al, when taken individually or in combination fails teach or suggest a method for split compiling an E/C source code

(ECL) using a combined E/C compiler comprising an Esteral computer language, C language, an Esteral compiler, and a C compiler as claimed in claims 4, 5, and 51.

Further, Dean e al, taken individually or in combination, fails to teach or suggest the features recited in claims 6-38 and 41-44 when these features are considered in combination with those of the base and intervening claims they depend from.

15. Claims 4, 5, and 51 would be allowable if rewritten to correct the above-identified 35 U.S.C. § 112(2nd) and 35 U.S.C. § 101 deficiencies.

16. Claims 6-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Claims 41-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

18. The following summarizes the status of the claims:

35 USC § 112 (2nd) Rejection: 1-2, 4-5, 39-40, 45-46, 49, 50, and 51

35 USC § 101 Rejection: 1-46

35 USC § 102 Rejection: 1-3, 39-48, and 50

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Blickstein**, US 5,577,253 discloses a prior art that contains a generic compiler back end which may be used by a plurality of front ends to generates object code for a target computer system.

**Faiman**, Jr. et al., US 5,493,675 discloses a prior art that contains a front end for different source languages, which are compiled through different language compilers, then got generated to intermediate language. The intermediate language represents any of the source code languages in a universal manner, so the interface between the front end and back end is of a standard format, and need not be rewritten for each language-specific front end.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Ching Chow whose telephone number is 571-272-3693. The examiner can normally be reached on 7:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chih-Ching Chow

Examiner

Art Unit 2122

CC

ANTONY NGUYEN-BA
PRIMARY EXAMINER